

PROCEEDINGS
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NEW FLORIDIAN SUBSPECIES OF THE GENUS
LIGUUS.

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The following new subspecies of *Liguus* have been collected by the writer in Lower Florida during a residence of twenty-two years in that State.

Liguus solidus crassus, n. subsp.

Shell solid, with about seven somewhat rounded whorls; Columella decidedly truncated or even twisted; columellar area covered with a thick, shining callus. Entire shell ivory white excepting a narrow, faint spiral dark line at the periphery. The outer lip is reinforced within by a strong callus which extends the entire length of it.

The type measures: Length, 48 mm.; diameter, 26 mm.

The type was collected on Watson's Hammock, Big Pine Key, Florida, in 1885. I have a smaller specimen from Key West, possibly adult which measures: Length, 26 mm.; diameter, 17 mm.

The type is in the author's collection.

Liguus solidus lineatus, n. subsp.

Shell large, thin, with somewhat rounded whorls, pale greenish yellow with spiral green lines, those on the base more closely spaced and broader, often with a red-brown line around the periphery. Apex and columellar area pink; no dots at the suture nor longitudinal smears.

The type measures: Length, 66 mm.; diameter, 28 mm.

The type was collected on the north side of Lignumvitae Key, Florida.

This is figured in Pilsbry's "Variation and Zoogeography of *Liguus* in Florida," Pl. XXXVII, figs. 4c and 4d as a form of Var. *lignumvitae* but among more than a thousand specimens examined I have always found it distinct.¹

The type is in the author's collection. Paratypes Cat. No. 339108, U. S. N. M. (3 specimens).

¹ It is also figured in the writer's book, "In Lower Florida Wilds," colored frontispiece, fig. 3 (G. P. Putnam's Sons, New York).

Liguus solidus pseudopictus, n. subsp.

Shell large, thin, with slightly rounded whorls, with a dark sutural band that is continued to the aperture, pale, greenish yellow with longitudinal bluish or purplish smears. Just above the suture is a row of brownish blotches and immediately below it is another, the latter markings smaller.

The type measures: Length, 62 mm.; diameter, 30 mm.

The type was collected near the upper end of Lower Matecumbe Key, Florida.

This resembles *L. solidus pictus* of the lower chain of islands but is larger and somewhat differently colored. The type is in the author's collection.

Paratypes, Cat. No. 339109, U. S. N. M. (1 specimen).

Liguus solidus delicatus, n. subsp.

A small form is found on Lower Matecumbe Key which is somewhat semi-transparent. It has a few faint spiral lines which are solid or broken into dots.

The type was collected on the upper end of Lower Matecumbe Key, Florida. It is in the author's collection.

Liguus crenatus capensis, n. subsp.

Shell elongated, solid, with rather flat whorls, white throughout with narrow, green spiral lines.

The type measures: Length, 58 mm.; diameter, 27 mm.

The type was collected on Northwest Cape Sable, and hammocks nearby.

This subspecies is very close to the typical *crenatus* of Cuba. The type is in the author's collection. Paratypes Cat. No. 339092, U. S. N. M. (2 specimens).

Liguus crenatus vacaensis, n. subsp.

A solid, elongated form which is close to *capensis* but differs by having convex outlines to the spire and fewer revolving green lines.

The type was collected southwest of Conchtown, Key Vaca, Florida, and is in the author's collection. Paratype 339091, U. S. N. M. (1 specimen).

Liguus crenatus eburneus, n. subsp.

Shell rather solid, usually somewhat elongated, pure ivory white throughout, or rarely having a few faint spiral lines back of the basal part of the aperture.

The type measures: Length, 52 mm.; diameter, 26 mm.

The type was collected on Timb's Hammock, Lower Dade County, Florida. It has also been collected on the mainland from Long Key in the Lower Everglades north to Lemon City. The type is in the author's collection. It is figured in "Lower Florida Wilds," frontispiece, fig. 10, Paratype Cat. No. 339093, U. S. N. M.

***Liguus crenatus mosieri*, n. subsp.**

Shell small to medium size, generally rather thin, with moderately rounded whorls, usually pale greenish yellow varying to whitish, and darker on the last whorl. Apex and columellar area pure white, the body of the shell having from few to many narrow green, spiral lines that are wanting at the periphery.

The type was collected at the upper end of Brickell Hammock, Miami, Florida. It is abundant in the great hammock at Miami; north to Arch Creek and south to Paradise Key in the Lower Everglades. It is named for Charles Mosier, an excellent naturalist and collector. The type is in the collection of the author. Paratypes Cat. No. 339104, U. S. N. M. (2 specimens).

***Liguus crenatus cingulatus*, n. subsp.**

Shell rather small, inflated, usually thin, with somewhat rounded whorls, pure white with a broad spiral pale yellow band on the upper part of the whorls and another on the base, with occasionally a few faint spiral lines.

The type measures: Length, 38 mm.; diameter, 20 mm.

The type was collected on Brickell Hammock, Miami, Florida. Others were collected at Timb's Hammock, Miami Hammock, Costello's Hammock, Dade County, Florida, and on Long Island of the Upper Keys. The type is in the author's collection.

***Liguus crenatus luteus*, n. subsp.**

Shell variable in size, rather solid, inflated or elongated; apex and columellar region white, the rest of the surface pale yellow to orange, lighter colored on the earlier whorls, often with a greenish peripheral spiral line and occasionally a few other faint ones.

The type measures: Length, 63 mm.; diameter, 25 mm.

Another specimen measures: Length, 38 mm.; diameter, 18 mm.

The type specimen was collected on Key Vaca, above Conchtown. The type is largely and richly colored. Others come from Long Key in the Lower Everglades north to Dania, Florida, and is abundant. The type is in the collection of the author. Paratypes Cat. No. 339094, U. S. N. M. (2 specimens).

***Liguus fasciatus alternatus*, n. subsp.**

Shell in almost every way like that of *castaneozonatus* except that the two broad spiral supra-peripheral and basal dark bands are broken into longitudinal bars of alternately light and dark brown, and the columellar area is rich red. This form may or may not have the narrow peripheral line as does *castaneozonatus*.

The type measures: Length, 45 mm.; diameter, 24 mm.

The type was collected on Timb's Hammock, Florida. Other specimens came from Shiel's Hammock, Lower Dade County, Florida. The type is in the author's collection. Paratype Cat. No. 339099, U. S. N. M. (1 specimen).

Probably a variation from *castaneozonatus* but among the 40 or 50 specimens I have seen there are no intermediates. It is figured in "In Lower Florida Wilds" frontispiece, fig. 8.

Liguus fasciatus ornatus, n. subsp.

Shell solid, with moderately rounded whorls, with reddish or purple apex and pink to deep violet columellar area, the surface yellow, orange or orange-brown becoming more richly colored on the last whorl. Quite often there are one to several greenish spiral lines on the last two whorls.

The type measures: Length, 46 mm.; diameter, 26 mm.

The type was collected on Paradise Key; it also comes from Long Key in the Everglades north to Miami. The type is in the author's collection. It is figured in "Lower Florida Wilds," frontispiece, fig. 11. Paratypes Cat. No. 339100, U. S. N. M. (2 specimens).

Liguus fasciatus miamiensis, n. subsp.

Shell rather small, subsolid, with moderately rounded whorls; apex and columellar area pink to deep violet; body of shell dull whitish; fourth, fifth and sixth whorls having a rather wide median band consisting of irregular brown blotches and zigzags. This pattern changes into narrow greenish lines which continue to the aperture. In some shells there is a narrow, reddish peripheral line.

The type measures: Length, 46 mm.; diameter, 23 mm.

Another specimen measures: Length, 38 mm.; diameter 30 mm.

The type was collected on Miami Hammock, and others northward to Ojus. The type is in the collection of the author. Paratypes Cat. No. 339098, U. S. N. M. (2 specimens).

Liguus fasciatus livingstoni, n. subsp.

Shell small to medium size, rather solid, with slightly rounded whorls; apex and columellar area pink to violet; the rest of the surface yellowish white or greenish white, with few to many green, bronzy or brownish spiral lines; there are sometimes a few faint brown blotches on the fourth to the sixth whorls.

The type measures: Length, 42 mm.; diameter, 22 mm.

Another specimen measures: Length, 45 mm.; diameter, 24 mm.

The type was collected at the north end of Brickell Hammock, and is named in honor of A. R. Livingston, who has been an indefatigable collector of Florida *Liguus* in almost inaccessible regions. The type is in the author's collection. Paratypes Cat. No. 339102, U. S. N. M. (2 specimens).

Liguus fasciatus elegans, n. subsp.

Shell usually rather small, subsolid, with decidedly flat whorls, with deep pink apex and columellar area. Surface of shell flesh colored or pale pinkish, with a few faint brownish blotches on the third, fourth and fifth whorls. There is a single brownish spiral line at the suture which is carried around the body whorl to the aperture and often a few faint spiral greenish lines on the last whorl.

The type measures: Length, 40 mm.; diameter, 22 mm.

The type was collected on a small island near Whitewater Bay. This beautiful form inhabits exclusively this small island hammock in the Lower Everglades a few miles east of Whitewater Bay. It rarely occurs in hammocks as far north as Arch Creek. One specimen obtained in a small hammock on Long Key in the Everglades is a giant, measuring 60 mm. in length and 32 mm. in diameter. I collected *Liguus* at Cabanas Bay in Cuba which are almost absolutely identical with this. It is figured in "Lower Florida Wilds," frontispiece, fig. 5. The type is in the author's collection. Paratype Cat. No. 339097, U. S. N. M. (1 specimen).

***Liguus fasciatus lineolatus*, n. subsp.**

Shell subsolid, with somewhat rounded whorls, with rich pink apex and columellar area; general surface of the shell pale pinkish or flesh color, often tinted with pale ochraceous towards the aperture. There are generally a few faint greenish or brownish spiral lines on the last whorl and in many specimens there is a deep buff or pinkish peripheral line.

The type measures: Length, 65 mm.; diameter, 32 mm.

Another specimen from Pumpkin Key measures: Length, 45 mm.; diameter, 22 mm.

The type was collected on Totten's Key; other specimens came from Cape Romano region; Chokoloskee; East Cape Sable; South shore of the mainland; Miami Hammock; Upper Keys. It is figured in "Lower Florida Wilds," frontispiece, fig. 2.

Dr. Pilsbry figured two forms in his paper in the Journal of the Academy of Sciences of Philadelphia under the name *roseatus* but designates the first three figures on Plate XXXVIII as the types. These all have a broad spiral band on the upper part of the body whorl and differ considerably, especially figure 11B, from the figure 18 which I refer to *lineolatus*. Both forms are widely distributed and are somewhat variable but each occurs in several localities where the other is not found. The broad yellow banded form occupies exclusively an Everglade Island hammock not very far from Whitewater Bay while the *lineolatus* is very abundant on Pumpkin Key and is the only form found on the island. The type is in the author's collection. The Museum specimens came from Chokoloskee Cat. No. 339105, U. S. N. M., and were presented by the author.

***Liguus fasciatus versicolor*, n. subsp.**

Shell rather small, somewhat solid, brilliantly polished, with slightly rounded whorls. The ground color may be bluish green with yellow zigzags and longitudinal markings, or yellow with brown markings of various designs along the suture and at the periphery. In all the shells there is a light peripheral line and it is often bordered with burnt brown. Apex deep pink; columellar area pink to whitish.

The type measures: Length, 40 mm.; diameter, 22 mm.

The type was collected at Big Hammock, Long Key in the Everglades; it also occurs sparingly north to Miami. It is figured in "Lower Florida

Wilds," frontispiece, figure 12. The type is in the collection of the author. It is one of the most beautiful and variable shells in the world. Paratypes Cat. No. 339101, U. S. N. M. (3 specimens).

Liguus fasciatus castaneus, n. subsp.

Shell moderately solid, with slightly convex whorls, varying from rich chestnut to almost black, and marked with longitudinal or zigzag yellow flames. Columellar area tinted purplish; apex purplish or whitish. In all except the darkest shells there is a light band at the periphery.

The type measures: Length, 40 mm.; diameter, 20 mm.

Another specimen from Long Key, Everglades, measures: Length, 46 mm.; diameter, 26 mm.

The type was collected from Cox Hammock, Paradise Keys.

There are intermediates between this form and *testudineus* on the one hand and *versicolor* on the other and all three doubtless are hybrids between *marmoratus* and some form of *fasciatus*. The type is in the collection of the author. Paratypes Cat. No. 339106, U. S. N. M. (1 specimen).

The author has in preparation a monograph of the Floridian *Liguus*, discussing their origin, migration and colonization in our state, and their general ecology.